

VIII. DESCRIPTION OF RESTORATION ALTERNATIVES

Based on the information developed in the existing conditions analysis, the four alternatives have been proposed to meet the restoration objectives (in addition to the No Action Alternative). These are described below in terms of both wetland restoration and land use. Note that alternative locations for disposal of excavated material are discussed separately in Section X.

The diagrammatic land use alternatives shown are intended to reveal the potential physical relationships, use patterns and landscape experiences that can be created at Muir Beach in relation to the wetland restoration alternatives. This environmental assessment addresses only those land use issues which are directly related to wetland restoration. Other land use issues will be more fully addressed in subsequent NEPA/CEQA documents.

A. NO ACTION

1. Wetland Restoration

Under the No Action alternative Redwood Creek would remain in its current alignment, and there would be no physical modifications to the existing site. All existing fill and levees would remain in place. Existing trails, parking facilities, and land use would remain as they are today.

2. Land Use

Under this alternative, the following existing land uses could remain in place:

Green Gulch Farm:

- Green Gulch existing and future agricultural practices not modified by restoration.
- Lower farm fields available for continued pasturing, or other agricultural uses identified by Green Gulch management.
- Existing stream channels and wetland retained; levee maintenance depending on actions of Green Gulch.

Golden Gate Dairy Horse Stables:

- Horse use on Green Gulch land continues, subject to agreement of land owner.
- Horse use on GGNRA land continues subject to modifications for sustainability and improved management.

Golden Gate National Recreation Area:

- existing habitats (riparian, grassland) retained.
- existing trails, parking, picnic areas, restrooms retained in present configuration.

The planning process has identified many areas where improved management by the existing land owners, separately or in partnership, could improve the protection and enhancement of natural resource values, and address concerns raised by the community regarding the operation of park facilities. Selection of the No Action alternative would not preclude management modifications to address issues raised during the planning process. These management modifications could include:

- Modifications to existing parking lot to provide improved flood flow capacity to relieve upstream flooding.
- Fencing of sensitive riparian and wetland areas to eliminate horse use, and providing adequate pasture setbacks, vegetative buffers, filter strips and runoff control to improve water quality.
- Enforcement of parking regulations and dog controls.
- Improved management of horses on the east side of Highway 1 at the Dairy site to reduce erosion and water quality impacts.

These are illustrated in Figure VIII-1.

B. RESTORE HISTORIC WETLAND

1. Wetland Restoration

The goal of this alternative, illustrated in Figure VIII-2, is to create a fresh-to-brackish wetland that reproduces the ecological functions of the pre-1850's wetland system. Redwood Creek would be

routed into its historic alignment, and all levees and water control structures would be removed downstream of the Pacific Way bridge. The creek would discharge through a natural delta into a fresh water lagoon and wetland system. The pond would discharge into the tidal lagoon through a natural channel located near the existing beach footbridge.

Pond and fringe wetland areas would be created by removing over 6 feet of fill material from the Green Gulch pasture and the riparian woodlands adjacent to Redwood Creek. Removal of this material would restore ground elevations to the historic lagoon/wetland elevations found in the soil corings. Graded elevations in the ponds would be between +0 and +1 feet NGVD. The fringe wetlands would slope gradually from about +3 feet NGVD near the edge of the ponds to +5 feet NGVD at the boundary of the wetland system. Portions of the pasture levee would be left in place as habitat islands. The overall boundary of excavation would be within the existing 10-foot contour line.

Earlier drafts of this alternative proposed expanding the wetland to the edge of Pacific Way. In response to comments from the Technical Advisory Committee and subsequent analyses, this alternative has been modified to expand the riparian buffer zone along Pacific Way to ± 100 feet in width. This buffer will be constructed from a combination of enhanced existing riparian habitat and restored habitat.

The drainage channels from Green Gulch would enter the northeastern side of the wetland, and would be graded in their lower reaches to provide a stable transition into the wetland. Future restoration of the upstream reaches of these drainage channels, while not included in this alternative, would further improve water quality and enhance the ecological functions of the restored wetland system.

Water surface elevations within the system would be controlled by natural sediment deposits at the point where the pond discharges into the beach and tidal lagoon. The existing sediment delta, which was created by the current unnatural sediment transport regime, would initially be cleared and graded to an elevation of +2 feet NGVD. Under restored conditions, the elevation of this sediment deposit would be built up and maintained by wind-blown sand and sand deposited during storm surge tides. The elevation and configuration of the deposit would fluctuate in response to storm flows and wave events, but would average at about +3 feet NGVD.

Removal of the pasture levee and excavation of the marsh across from the parking lot would widen the creek outlet sufficiently to convey a 10-year flood, thus reducing flood hazards upstream. Fill would be removed from the picnic area and end of the parking lot and the area would probably be revegetated by riparian habitat grading into the beach area.

Water depths would vary seasonally depending on freshwater inflow rates. During the winter and spring large volumes of water would enter the system, and water depths might range from 3-4 feet in the ponds to 1-2 feet in the fringe wetlands. As inflows drop in the early summer, water levels would recede until they reached the control elevation determined by the downstream sediment delta.

Water depths in the summer would range from 2-3 feet in the ponds to below the ground surface in the fringe wetlands. In drought years evaporation would exceed inflows in the late summer, and water levels could drop about 0.6 feet below the control elevation.

With a control elevation at about +3 feet NGVD, saline water would occasionally enter the wetland during spring high tides. This would occur only when freshwater flows are high, and brackish water would be rapidly flushed out. Backwater areas along the Redwood Creek Delta would be sheltered from these pulses of saline water.

Although not required, Alternative B can be done in conjunction with enhancement and restoration of the tidal lagoon and dune habitat seaward of the parking lot. Alternative E addresses tidal lagoon and dune restoration.

The main capital cost of Alternative B would be the excavation and removal of about 120,000 cubic yards of fill material. The wetland system would be designed to function and evolve naturally, and maintenance costs would be minimal.

Because of the large excavation cost for this alternative, it is probable that the project would be completed in phases. Phasing would also reduce short-term ecological impacts of construction by maintaining areas of existing habitat during the early phases. A more detailed discussion of this is provided in the ecological impacts section.

2. Plant Restoration Recommendations

Care must be taken during the restoration process not to destroy the species that are already present, particularly the red-legged frogs and pond turtles. In order to successfully meet this goal, the projects must be staggered in such a way so that the population remnants have a chance to recover in between excavation events. Funding constraints aside, this would probably require a minimum of 3 or 4 years. The timing of successive phases would be determined by a long-term monitoring program focused on specific groups. In order to maximize the recovery speed of animal species, there must be an active program of re-vegetation to provide habitats suitable for the maintenance of stable populations. Although it would probably be effective in the long run, natural re-colonization of native vegetation may take too long if subsequent restoration phases are to be implemented in a reasonable length of time.

In addition to phasing the restoration effort to allow populations to persist, a detailed set of construction procedures must be formulated and scrupulously followed. The mitigation steps for the actual excavation should include seasonal and weather considerations, flagging, and on-site oversight by a biologist. A detailed mitigation program will be necessary before any of the alternatives are implemented.

Weed control should be a major restoration strategy. Invasive weeds usually occupy soils which have been disturbed and cleared of native plant assemblages. Minimizing land disturbances can reverse the advantages enjoyed by weeds, and with time many native species can recover. The recovery process is most rapid in the wettest habitats, where natives are present and there are fewer aliens. Many aliens will thrive beyond the edge of the wettest soils, and therefore should be actively eradicated. Measures to control disturbances, such as preventing trampling by using fences, walkways and signs, should also be incorporated into restoration efforts. Bare soil should be filled by desirable native species as soon as possible to prevent alien invasion. The sites can be seeded or planted with roots, cuttings, and whole plants. The most important weed control and planting of native species is considered below.

Most of the low, excavated pasture areas require little weed control or replanting. There are ample nearby sources of native plants for colonization: the long period of ponded water favors native wetland species over most potential pests. Pasture channels and pond currently support emergent, shallow water and wet ground native plants that should be used as on-site material to revegetate the excavated areas. Root material of tules, cat-tails, rushes, sedges, and herbaceous forms such as water parsley, water plantain, smartweeds and duckweed could be dug from the pasture and stored for reburial after construction excavation.

Bare soils along the edge of excavated pasture should be planted with a wetland cover crop, such as meadow barley. This is a short-lived perennial grass, the seed is relatively inexpensive and readily available, and the species does well in low, damp areas. It provides a dense blanket of grass excluding most weeds from establishing as long as their seeds are not present when the barley is sown. With time, other natives will colonize the barley stands, which only last a few years. Root mats and seeds of other desirable wetland species can be obtained from the site or upstream and included in the meadow barley plantings. This material includes trees such as maples and Box elders along the edges, and herbaceous species including rushes, sedges, and grasses such as hair grass, reed grass and native bent grass.

Pasture excavation should be done during dry months to minimize soil erosion. Native Meadow barley is perhaps the best plant to stabilize wetland and near-wetland soils after excavation. It therefore has several important merits.

The present willow riparian lacks a well developed herbaceous understory community. Trampling and weed invasion may be the two main limiting agents. The young age of the grove may also be important. Seeds and plants of elk clover, California bottlebrush grass and Solomon's seal from upstream could be transplanted to the understory. Reducing disturbances might be most important and effective. Access should be prohibited or restricted to boardwalks. Invasive weeds such as German Ivy, should be exterminated by weeding or poisons.

Kikuyu grass is widespread and appears to be aggressively moving into pastures, aquatic settings, marsh and rear dunes. It does not need a disturbed opening but will grow over healthy native plant assemblages. This is apparently true in the salt marsh and lower riparian, although trampling

disturbance may also play a role. The salt marsh is bordered by a robust Kikuyu grass population and is perhaps the most threatened by this invader. Repeated poisoning with Round-up is an effective control and should be applied to Kikuyu grass throughout the undisturbed wetland.

Severe trampling and the past drought have stressed the salt marsh. Some or most of the underlying soil is fill. Pedestrian traffic should be diverted away from the seasonally wet soils and relatively delicate silverweed and rush community, allowing a natural recovery of the community. Unlike Kikuyu grass, weeds such as ox-tongue, radish and poison hemlock will probably disappear under wetter conditions and relief from trampling. Seasonal mowing should hasten their control. Pampas grass should be dug out and/or poisoned.

The parking lot, picnic area and exiting trails are heavily impacted by people, but they can be greatly improved by native plant landscaping with a public education component. Native plants can be used to provide a relatively low-maintenance botanical garden setting, displayed in a narrow border with smaller, low species fronting taller ones. A mix of plants from surrounding hillside scrub communities can manage on the dry, compacted fill soil. Monkey flower, California sage, black sage, even poison oak can be planted to form low shrub borders in front of larger shrubs of ocean spray, toyon and ceanothus. Hardy understory species such as needlegrasses, wildrye and bent grasses resist trampling while forming the lowest border to the native display. On damper soil, riparian species can provide pleasing plant displays with high educational value. Hazelnut, silktassel, dogwood, lupine, elk clover, Solomon's seal, native fescues, bromes, hairgrass, and bent grass could be arranged by height in another border display. The resulting educational display is free or nearly free of maintenance.

3. Land Use

Land use under this alternative would be changed to accommodate the new wetland, and to reduce the impacts of adjacent land uses on wildlife, water quality, and sediment erosion (Figure VIII-3). The following specific land use features would be included:

Green Gulch Farm Agricultural Use:

- Retain potential future agricultural use of Green Gulch fields #6 and majority of #7, and lots adjacent to Pacific Way retained.
- Trail connection to Green Gulch, including emergency vehicle access between Pacific Way and Green Gulch Trail, would be retained.

Golden Gate Dairy Stables: GGNRA and Green Gulch Farm:

- Horse pasture in the lower Green Gulch fields would be replaced by restored stream channel and wetlands.
- Horse arena and 9-acre hillside pasture retained, subject to agreement of landowner and installation of appropriate erosion and water quality control measures. In particular, erosion problems on the hillside pastures will need to be addressed.
- Horse use on GGNRA land east of Highway 1 retained subject to modifications for sustainability and improved management.
- Size of horse operation reduced over time to a sustainable level on GGNRA and Green Gulch land.
- Horses displaced by wetlands would be accommodated in an adjacent field owned by Green Gulch (Field #6), or on GGNRA land at the former ballfield site (or another stable facility), as an interim measure, until through attrition the number of horses reaches a sustainable level that can be accommodated at the Dairy site.

Golden Gate National Recreation Area:

- Existing parking lot retained, and modified as needed to increase the riparian buffer zones. No increase in number of parking spaces. Twenty to twenty-five of existing parking lot could be eliminated.
- Trail connections from parking lot to Coastal and Green Gulch trails retained.
- Levee trail eliminated, and loop trail provided on new trail along Pacific Way between road and wetlands, connecting to trail bridge and to trail between Pacific Way and Green Gulch Trail.
- Trail bridge at parking lot relocated to improve trail connection and reduce impact of trail use on dunes.
- Picnic facilities and restroom retained.

C. RESTORE HISTORIC WETLAND AND PRESERVE RIPARIAN WOODLANDS

1. Wetland Restoration

This alternative, shown in Figure VIII-4, could be done as an initial phase of Alternative B. The goal here is to create a wetland that reproduces the ecological functions of the historic wetland system, while at the same time preserving the existing riparian woodlands between the pasture levee and Pacific Way.

As in Alternative B, Redwood Creek would be rerouted into its historic alignment. Pond areas would be graded to +0 to +1 feet NGVD, and fringe wetlands would slope upward from +3 to +5 feet NGVD. The pasture levee would be breached and removed in several places to connect the wetland to the existing riparian woodland and the backwater portions of Redwood Creek. Sediment and vegetation would be cleared from the outlet delta, and the parking lot would be modified to provide riparian buffer habitat.

Rerouting Redwood Creek would divert most flows from the existing channel downstream of the Pacific Way bridge. The abandoned creek bed would be allowed to fill in naturally with willows and riparian vegetation. During large storm events this reach would function as an overflow channel.

The hydrologic regime of the wetland would be similar to that described for Alternative B. Ponds would have water depths ranging from over 4 feet in the winter to less than 2 feet in the late summer. Fringe wetlands would be seasonally inundated.

The primary cost for this alternative would be the removal of over 100,000 cubic yards from the Green Gulch pasture area. As in Alternative B, the wetland would be designed to require minimal maintenance. This alternative could be done in two phases, where the first phase would create the backwater pond in the lower pasture (Alternative D).

2. Plant Restoration Recommendations

Revegetation and plant restoration would be performed in the same manner as described for Alternative B above.

3. Land Use

Land use under this alternative would be similar to Alternative B, and would include the following features (Figure VIII-5).

Green Gulch Farm Agricultural Use:

- Potential future agricultural use of Green Gulch field #6 and majority of field #7, and lots adjacent to Pacific Way retained.
- Trail connections to Green Gulch, including emergency vehicle access between Pacific Way and Green Gulch Trail would be retained.

Golden Gate Dairy Stables: GGNRA and Green Gulch Farm:

- Horse pasture in the lower Green Gulch fields would be replaced by restored stream channel and wetlands.
- Horse arena and 9-acre hillside pasture retained, subject to agreement of landowner.
- Horse use on GGNRA land east of Highway 1 retained subject to modifications for sustainability and improved management.
- Size of horse operation reduced over time to a sustainable level on GGNRA and Green Gulch land.
- Horses displaced by wetlands would be accommodated in an adjacent field owned by Green Gulch (Field #6), or on GGNRA land at the former ballfield site, as an interim measure, until through attrition the number of horses reaches a sustainable level that can be accommodated at the Dairy site.

Golden Gate National Recreation Area:

- Existing parking lot retained, and modified as needed to provide improved storm flows. No increase in number of parking spaces. 20-25 of existing parking lot could be eliminated to allow for modifications for improved Redwood Creek storm flows.
- Trail connections from parking lot to Coastal and Green Gulch trails retained.

- Levee trail eliminated, and loop trail provided on new trail along Pacific Way between road and wetlands, connecting to trail bridge and to trail between Pacific Way and Green Gulch Trail.
- Trail bridge at parking lot relocated to provide improved trail connection and reduce impact of trail on dunes.
- Picnic facilities and restroom retained

D. EXPAND BACKWATER POND INTO LOWER PASTURE

1. Wetland Restoration

This alternative could be done as Phase 1 of Alternatives B or C, and is shown in Figure VIII-6. Alternative D leaves Redwood Creek in its existing alignment, and creates a backwater pond and wetland in lower Green Gulch pasture. The pasture levee would be breached at the upstream and downstream ends of the existing backwater channel to provide a hydrologic connection to Redwood Creek. Sediment and vegetation would be cleared from the outlet delta, and the parking lot would be modified to provide riparian buffer habitat.

Because of its smaller size, the Phase 1 wetland would be created as a backwater pond to inhibit direct sediment input from Redwood Creek. Pond areas would be graded to +0 to +1 feet NGVD, and fringe wetlands would slope upward from +3 to +5 feet NGVD. The wetland would extend from the lower end of the pasture up to the existing Green Gulch Creek, and would include both of the Green Gulch drainage channels.

To prevent Redwood Creek from migrating into the existing backwater channel, the Redwood Creek levee would be strengthened downstream of Pacific Way. A section of this levee and the pasture levee would also be lowered to allow large floods to spill from Redwood Creek into the pasture and wetlands. This would reduce upstream flooding by providing additional flood storage.

Water levels in the restored wetland would fluctuate as described for Alternatives B and C. Because the wetland would be connected to Redwood Creek as a backwater, circulation and flow velocities would be less dynamic. Less sediment would also be delivered into the ponded areas.

This alternative would require about 50,000 cubic yards of excavation.

2. Plant Restoration Recommendations

Most of the same restoration recommendations made for Alternative B also apply here. However, since only about half of the pasture will be excavated and converted to marsh in this alternative, the

present alien vegetation on the unexcavated pasture should be controlled and replaced with a mixture of higher marsh species and lower hillside forms. Control can be by herbicide or a combination of herbicide and cultivation, since the pasture grasses are well established and a strong seed bank undoubtedly exists within the soil. Native meadow barley can be planted in the unexcavated pasture and along the excavation edge as described in the last section. Swale communities are helpful models to guide species selection for the unexcavated pasture. Bog lupine, monkey flower, water parsley, rushes and sedges, and wetland and moist soil grasses such as hairgrass, California oatgrass, manna grass, and perhaps even some species of special concern can be gardened here. If the present mix of pasture grasses and weeds, opportunistic and planted, are left alone, they are likely to persist and exclude or retard re-establishment of native communities, whether or not they are grazed.

More of the levee is retained in this alternative. After breaking open sections, the levee will be a series of dry islands between low marsh and seasonally flooded riparian. The mixture of habitats provides valuable wildlife habitat. If much of the structure is left intact and reserved exclusively for natural communities (no public access), weed control and revegetation is relatively easy. Mechanized weed control by mowing and poisoning is fast and effective. Herbicide, particularly Round-up, should be applied to undesirable annual weeds well into the growing season but before buds have set. For example, pasture grasses could be sprayed by hand or with a tractor drawn sprayer, in March or April when plants are six to twelve inches high. Native perennial grasses are appropriate to propagate on the hard dry soil and can be efficiently planted by mechanized seeding.

Native species occur on the levee and should be considered before weed control is initiated. California canary grass and meadow barley should probably be conserved and allowed to multiply naturally or through propagation. Other species such as shrubs of California sage and lupines, may be propagated from adjacent upland populations. Kikuyu grass, poison hemlock and thistles are the main pests. Himalaya berry and German ivy encroach from the riparian side.

3. Land Use

Land use under this alternative would include the following features (Figure VIII-7):

Green Gulch Farm Agricultural Use:

- Same land use as under Alternatives B and C.

Golden Gate Dairy Horse Stables: GGNRA and Green Gulch Farm:

- 2-3 acres on west side of Highway 1, including the arena, and 9 acre hillside pasture retained for continued horse use subject to approval

of Green Gulch Farm, and appropriate setbacks/ and water quality improvements.

- Other horse pastures on Green Gulch land replaced by lagoon/wetland restoration.
- Horse use on GGNRA land east of Highway 1 retained subject to modifications for sustainability and improved management.
- Size of horse operation reduced over time to a sustainable level on GGNRA and Green Gulch land.
- Horses displaced by wetlands would be accommodated in an adjacent field owned by Green Gulch (Field 6), or on GGNRA land at the former ballfield site, as an interim measure, until through attrition the number of horses reaches a sustainable level that can be accommodated at the Dairy site, on the east side of Highway 1.

Golden Gate National Recreation Area:

- Same land use as under Alternatives B and C.

E. ENLARGE TIDAL LAGOON AND RESTORE DUNES

1. Wetland Restoration

The goal of this alternative, illustrated in Figure VIII-8, is to restore the lower lagoon portion of the site to historic conditions. The tidal lagoon would be enlarged by excavating into the adjacent filled areas. About 2-feet of surface fill would be removed from all areas seaward of the picnic grounds. This alternative could be done in conjunction with or independent of Alternatives B, C, or D.

About 0.8 acres of lagoon habitat would be created (at maximum inundation levels), with bottom elevations at about +2 feet NGVD. Dunes would evolve naturally to elevations ranging from +10 to +13 feet NGVD, similar to the existing dunes in the southeast end of the beach. Restoration of the dunes would require removal of the riparian vegetation that has colonized the Redwood Creek delta.

This alternative would require 3,600 cubic yards of excavation to remove fill and create the lagoon. Dunes would be allowed to evolve naturally after removing all of the artificial fill. Wave action and inundation by ponded lagoon water would prevent the establishment of vegetation, and wind-blown sand would begin to build up the historic dune field.

2. Plant Restoration Recommendations

Again, most of the restoration alternatives presented for Alternatives B, C, and D apply here as well. The one exception concerns the salt marsh: this area will be covered with sand dunes in the present alternative. The present alternative will leave an even greater area of pasture covered with alien plants, which should be controlled and replaced with native species.

The dunes are subject to severe natural forces of wind and erosion. However dune plant communities should be better developed on the southeast corner than they currently are. Trampling by people appears to have killed most vegetation, and certainly prevents re-establishment. Continued trampling will jeopardize the small patches of vegetation which stabilize some small dune mounds, maintain the open areas, and facilitate the spread of weeds. Signs, boardwalks and roped-off areas are relatively simple measures to control people's activities and motivate them to allow some relief to dune communities.

The new dunes and protected areas of the existing dune should be planted with native dune species. Since the California Department of Parks and Recreation has initiated some of the most successful dune restorations in the country, restoration details are not presented here. Dune restorations provide an excellent opportunity for public education and involvement. Propagating the few appropriate species to outplant is an attractive community effort because of the ease, good success, and high profile. Dune restoration projects are common along the coast and provide many good models.

European dune grass and ice plant should be controlled. The alien dune grass has great potential for monopolizing large areas. The only technique for control so far identified is physical removal of the extensive rhizome system. The existing colony is localized and small. Relatively little initial work now would control the grass, and an even smaller monitoring and follow-up effort would complete eradication.

Ice plant is very widespread on coastal sands and always poses a threat to unmanaged disturbed sands. It is not extensive on the site. It can be pulled or effectively poisoned. Reputable contractors specialize in using Round-up to kill iceplant. If the killed plant material is left in place, it helps to stabilize the sand and allows native species to be planted or to recruit into the organic structure.

3. Land Use

Land use under this alternative would require the following land use changes, primarily on GGNRA land:

- Existing trails, parking, picnic areas, restrooms would be retained in the present configuration.

- Open space between the parking lot and beach would be modified for dune restoration; boardwalk or other trail surface would be provided for beach access.

F. PARKING LOT ALTERNATIVES IDENTIFIED BUT NOT FURTHER CONSIDERED FOR THIS PROJECT

As shown on the 1853 map of the site (Figure III-1), the Muir Beach parking lot currently occupies an area that was once wetland and lagoon habitat. While the parking lot does not limit the restoration of a functioning lagoon/woodland system, it does constrain the boundaries of the restored wetland. Removal of the parking lot could provide over 1 acre of additional restored habitat.

To address the potential for wetland restoration in this area, two alternatives for parking lot relocation were considered. As discussed below, each of these poses land use, access, and ecological problems that need to be further addresses. These will be analyzed and discussed further in subsequent NEPA/CEQA environmental documents.

1. Remote Parking at the Ballfield

- Remove the existing parking lot and replace with turn-around and drop-off.
- Create new parking lot/staging area at existing 'ballfield' at intersection of Highway 1 and Frank's Valley road (+/- one half mile from beach).
- Restrict vehicular access along Pacific Way.
- Shuttle between the parking lot and the beach may be necessary.
- Make trail connections to beach along Highway 1 and through the Alderwood (raised boardwalk).
- Make direct trail connections to Coastal Trail and Redwood Creek Trail.

Only limited support for this alternative was found among the members of the community participating in this outreach process. Specific concerns included: traffic impacts at intersection of Frank Valley Road. and Highway 1, safety of pedestrians crossing and along Highway 1, impacts of drop-off traffic at beach, access impacts of trail on biologically sensitive Alderwood area.

Further exploration of this alternative may be appropriate in the context of a broader community-wide planning effort and in relation to an overall parking and access analysis for the entire system of recreational destinations in the Muir Woods/Muir Beach area.

2. Remote Parking in the Lower Fields of Green Gulch

- Create one or a series of parking lots along the upper elevations of the lower Green Gulch Farm meadows, above the restored wetlands or along the levee.
- Restrict vehicular access along Pacific Way.
- Turn off towards the parking areas before crossing Redwood Creek.
- Direct trail connection to the beach without need of a trail bridge.

This alternative was not pursued as a result of additional adverse impacts including: proximity to the wetland habitats with significant access conflicts, reductions to the area available for wetlands or meadows, high visibility of parking rather than wetlands or pastures upon entering Muir Beach, reluctance of property owner to convert meadows and wetlands to parking if suitable alternatives are available elsewhere.